Jan. 14, 1941. C. W. ABBOTT 2,228,333

SEPARABLE ELECTRICAL CONNECTING DEVICE

Filed March 26, 1938 2 Sheets-Sheet 1

Fig. 1.

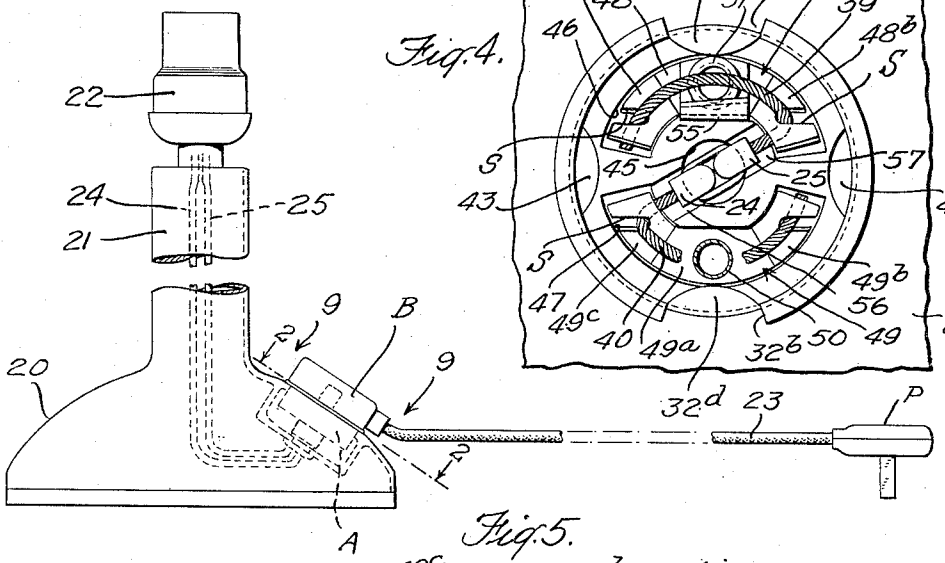



Fig. 4.




Fig. 5.

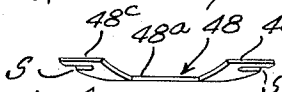



Fig. 3.

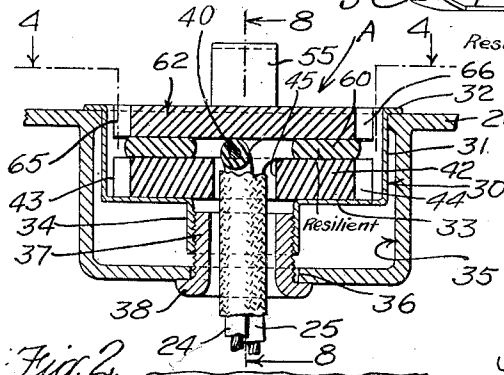



Fig. 8.

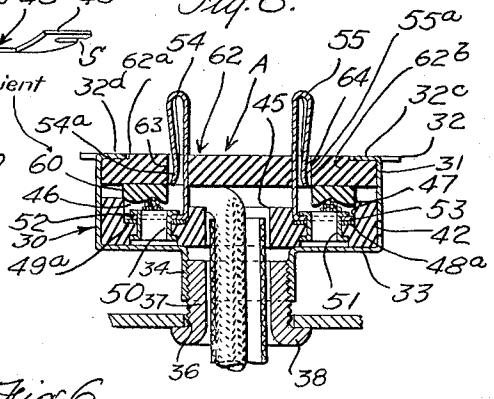



Fig. 2.

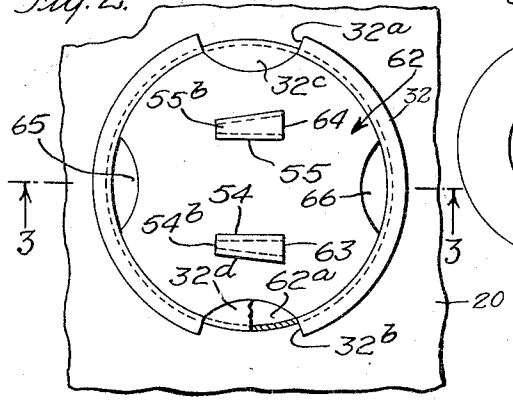



Fig. 6.

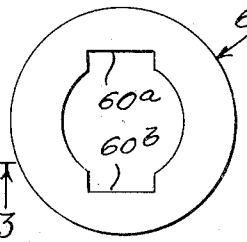
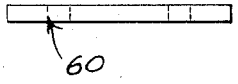



Fig. 7.




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Jan. 14, 1941. C. W. ABBOTT 2,228,333

SEPARABLE ELECTRICAL CONNECTING DEVICE

Filed March 26, 1938 2 Sheets-Sheet 2

Fig. 9.

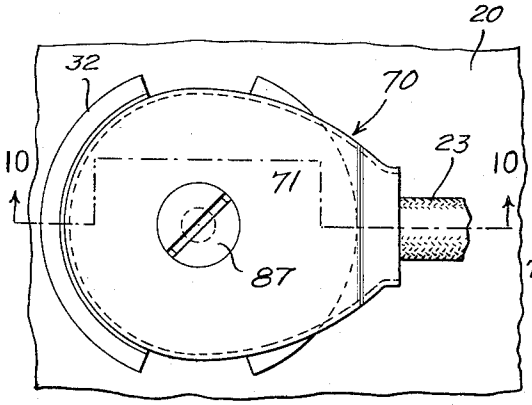



Fig. 11.

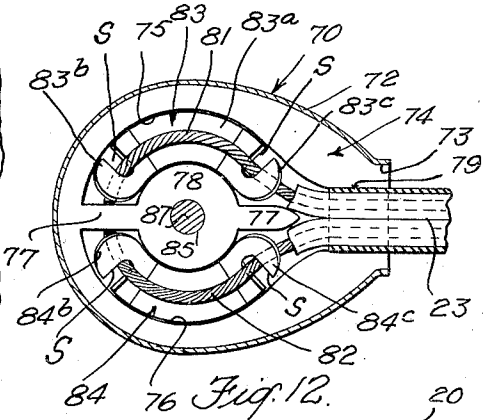



Fig. 10.

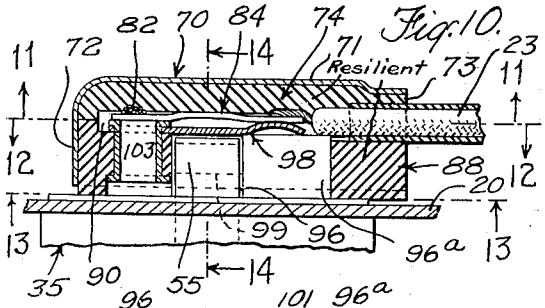



Fig. 12.

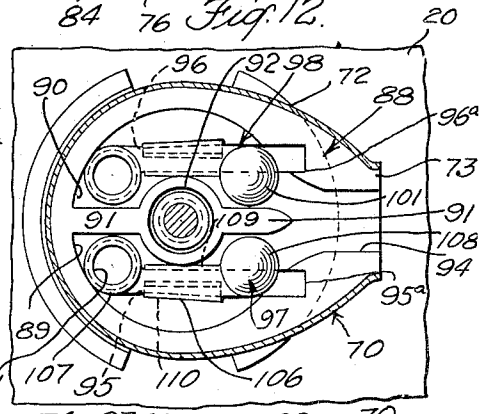
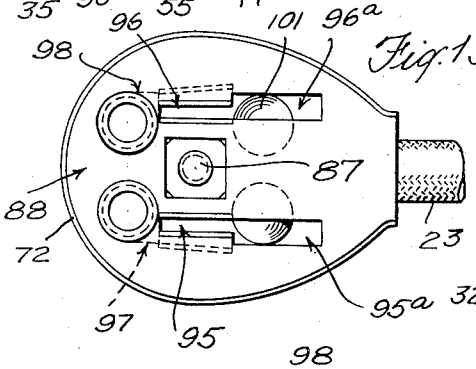



Fig. 13.



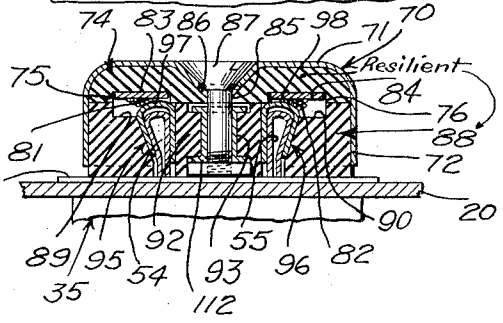
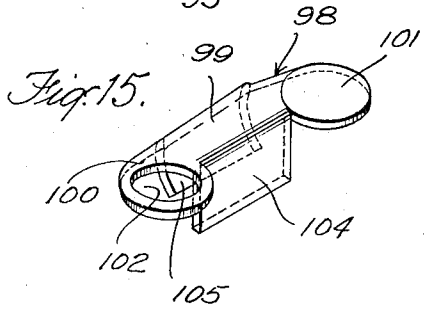




Fig. 14.

Fig. 15.




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2,228,333

# UNITED STATES PATENT OFFICE

2,228,333

## SEPARABLE ELECTRICAL CONNECTING DEVICE

Charles W. Abbott, Larchmont, N. Y.

Application March 26, 1938, Serial No. 198,174

18 Claims. (Cl. 173—328)

This invention relates to improvements in detachable or separable electrical connecting devices.

One of the objects of this invention is to provide a simple, reliable, safe and inexpensive construction for separable electrical connecting devices of the so-called plug-and-receptacle type and to overcome in a thoroughly practical and dependable way the many disadvantages, shortcomings and deficiencies of devices of this character as heretofore known. In such of the prior art devices of the plug-and-socket or plug-and-receptacle type in which either or both of the parts are capable of use in connection with so-called flexible cord conductor, many disadvantages, both structurally and functionally, are present; for example, strain or pull upon the conductor results in separation or disassembly of the two parts, or in distortion or breakage thereof or impairing the electrical contact or contacts so as either to break the circuit or to interpose such resistance as to give rise to arcing, sparking, or high resistance junctions, and the like. Also, in such prior devices, accidental or other misuse, particularly when accompanied or caused by strain or pull on the conductor, gives rise to partial mechanical separation with frequent exposure of electrically alive parts, thus giving rise to danger, particularly where such devices are used for household, industrial, and like purposes. Frequently, also, there is inadequacy of safeguard, even during normal use, against contact with live parts. One of the dominant aims of this invention is to provide a two-part separable connecting device of the plug-and-receptacle type in which such defects and deficiencies as have just been noted are dependably overcome and in which the highest degree of safety, even as against intentional or ignorant misuse, is reliably and inexpensively achieved. Another object is to provide a construction of this character that is well adapted to withstand the effects of severe pulls or strains on the conductor and more particularly to provide a construction in which such pulls or strains are dependably prevented from loosening up the electrical contact or engagement between the contact parts or from effecting mechanical separation of the two members or parts of the construction or from effecting partial separation thereof or from permitting even partial exposure of live or conductive parts or from effecting disengagement of the strained conductor from the part to which it is mechanically and electrically connected.

Another object is to provide a device of the above-mentioned character that will be capable in a thoroughly dependable and safe way of effecting the connection to an electrical appliance of a flexible cord conductor. According to prior practice, appliances, particularly household electrical appliances, are furnished with a length of flexible cord conductor, one end of which is permanently wired to the appliance and the other end of which has connected to it a plug connector; such prior and current practice is replete with many elements of deficiency, hazards, and mechanical and electrical shortcomings. For example, the outwardly exposed length of cord conductor might be of adequate insulation and other construction for its intended purpose as a flexible conductor but the very factors that make it adequate for that purpose might not be electrically and physically appropriate for functioning internally of the appliance in close association with the electrical device thereof; an illustration is in present-day high wattage electric table or stand lamps where that portion of the flexible cord conductor that is led up to the lamp socket is inappropriate to withstand the very high temperatures that are created by the operation of the lamp, though it might be entirely adequate as a flexible cord conductor extraneous of the standard to permit connection of the appliance to an outlet receptacle. Also, it is extremely difficult in such prior practice to repair or rewire the appliance, or to replace an externally worn out flexible cord, with the result that replacement or repair is delayed and the hazard increased. It is such and other defects of practice and constructions heretofore known that it is an object of my invention to eliminate in a simple, efficient and inexpensive way.

Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings in which is shown a preferred one of the various possible embodiments of my invention,

Figure 1 is a small-scale side elevation of an electrical appliance having related to it the detachable or separable connector device of my invention;

Figure 2 is a plan view of the appliance or fixture with the detachable connector device removed from its companion part, showing the lat-

ter as it appears exposed from the standard of the appliance;

Figure 3 is a vertical central sectional view, as seen along the line 3—3 of Figure 2;

Figure 4 is an elevation, as seen along the line 4—4 of Figure 3, showing the condition of one of the two separable connector members after the conductors have been related thereto;

Figure 5 is an elevation of a conductor contact and anchoring member, two of which are exposed to view in Figure 4;

Figure 6 is a plan view of a resilient insulating member that is to coact with the conductor anchoring member of Figure 5;

Figure 7 is a front end view thereof, as seen from the bottom of Figure 6;

Figure 8 is a transverse sectional view, as seen along the line 8—8 of Figure 3;

Figure 9 is a plan view, as seen along the line 9—9 of Figure 1;

Figure 10 is a transverse sectional view along the line 10—10 of Figure 9;

Figure 11 is a horizontal sectional view, as seen along the line 11—11 of Figure 10;

Figure 12 is a horizontal sectional view, as seen along the line 12—12 of Figure 10;

Figure 13 is a horizontal sectional view, as seen along the line 13—13 of Figure 10;

Figure 14 is a transverse vertical sectional view, as seen along the line 14—14 of Figure 10;

Figure 15 is a perspective view of a sheet metal contact member.

Similar reference characters refer to similar parts throughout the several views in the drawings.

Referring first to Figure 1, I have there shown by way of illustration an electrical appliance in the form of a table or stand lamp which may be in any suitable form and comprising a suitable base or support 20, preferably and usually hollow, from which there rises upwardly a part 21 at the upper end of which is mounted or secured in any suitable manner any suitable means for receiving an incandescent bulb, or the like, such as a lamp socket 22. This appliance is to be connected to a suitable source of current, such as the typical household 110-volt lighting circuit by means of a flexible insulated two-conductor structure or flexible cord, indicated generally at 23, and which may take any suitable or appropriate form; at the free end of the cord 23 is mounted a suitable device for connecting the conductors of the flexible cord 23 to the circuit and that device usually and illustratively takes the form of a two-prong plug generally indicated at P adapted to be plugged into any suitable form of plug receptacle related to the supply circuit.

As above indicated, many electrical appliances operate under conditions or are constructed to have operating characteristics which make it detrimental to extend the flexible cord structure 23 directly into the appliance and to connect it directly to the terminals of the latter. As illustrative of this condition, the appliance may take the form, as already above indicated, of a lamp wherein, as is particularly the case where high wattage lamp bulbs are employed, the appliance, particularly in those parts mechanically related to the bulb, such as the socket and the upper parts of the device 21, assumes such high temperatures that the physical and insulating materials employed in the cord structure 23 are inappropriate, being incapable of withstanding such high temperatures. Accordingly, I provide insulated conductors 24 and 25, preferably stranded, but provided with insulating material or coverings well suited to withstand these high temperatures or whatever other detrimental condition or circumstance exists. Where it is a case of withstanding high temperatures, the insulation of the conductors 24—25 may include materials like asbestos. Conductors 24—25 are connected to the terminals of the lamp socket 22 and extend downwardly through the part 21 into the hollow base 20 where their ends are connected to the terminals of the part A of a two-part mechanically separable connecting device AB, the part B of which has the flexible cord conductor 23 mechanically and electrically connected to it.

The part A comprises a sheet metal shell or casing 30 (Figures 3 and 8) having a cylindrical side wall 31 peripherally flanged at its upper end, as at 32, and provided with a bottom 33 which at its center is drawn or formed to provide a tubular neck or extension 34.

The casing 30 houses certain parts about to be described while the flange 32 and the tubular neck 34 are preferably provided to carry out a preferred method of mounting the device A in position with respect to the appliance, illustratively with respect to the base 20. The latter is preferably shaped to provide a cylindrical well 35 of appropriate dimensions to receive the shell 30 therein with the flange 32 resting, as shown in Figures 3 and 4, against the outer face of the part 20, and the bottom of the well 35 has a central opening 36 which becomes coaxially alined with the neck 34. The latter may be threaded as indicated to receive the inner end of a threaded bushing 37 whose other end has a flange 38 to take against the under face of the bottom of the well 35; accordingly, when the bushing 37 is screwed up, the shell 30 is drawn downwardly and the flanges 32 and 38 dependably clamp the appliance part 20 therebetween and securely hold the shell 30 and the parts carried thereby and hence the part A in its entirety securely in place.

Through the bushing 37 the insulated conductors 24 and 25 above-mentioned are brought up into the casing 30 where the insulation is removed from their end portions to expose the bared wires 39, 40, preferably stranded, as is better shown in Figure 4.

At two opposed and preferably diametrically opposed points, the flange 32 is interrupted, as at $32^a$ and $32^b$ (Figures 2 and 4) or is suitably cut and then bent inwardly toward the axis of the cylindrical casing 30, thus to provide two opposed ears $32^c$ and $32^d$ which, as is shown in Figure 8, preferably lie in the plane of the outwardly projecting flange 32, for a purpose later described. Seated against the bottom 33 of the casing 30 is a cylindrical or disk-like member 42 made of a suitable insulating material, preferably rigid, such as Bakelite, or the like, but the member 42, at two diametrically opposed points, has cut-outs 43, 44 in its periphery, appropriately shaped and dimensioned with respect to the tongues or ears $32^c$ and $32^d$ to by-pass the latter as the member 42 is inserted in an axial direction into the casing 30, ultimately to rest against the bottom 33. The member 42 has a central hole 45 which becomes alined with the passages through the neck 34 and the bushing 37 so that the conductors 24, 25 may be passed through the hole 45 to be exposed, with their bared ends 39, 40 above the upper face of the member 42.

In the upper otherwise flat face of the member 42 are formed two generally arcuate open channels 46, 47 (Figures 4 and 8) of substantial depth,

on the order indicated in Figure 8, for accommodating, respectively, conductor-engaging contact members 48, 49; the latter are made preferably of sheet metal that is bendable and preferably springy like phosphor bronze, and they are shaped or initially bent to have flat central portions 48a and 49a and upwardly bent end portions 48b, 49b and 48c, 49c. These end portions are slotted, as is better shown in Figure 4 as at S, the slots being preferably open-ended. In Figure 5 one of these bendable contact members, namely, the member 48, is shown in its normal or initial shape or condition, showing how the end portions 48b and 48c with the slots S therein normally extend at an angle upwardly from the plane of the central flat portion 48a. As indicated in Figure 4, the shape of these contact members 48, 49 is such that, while the central portions 48a, 49a thereof are preferably snugly received in the arcuate channels 46, 47, the upwardly extending bendable end portions are shaped so that when forced or bent downwardly into or toward the channels 46, 47, they freely enter into the channels themselves.

The contact members 48, 49 may be secured to the member 42 in any suitable way; illustratively and preferably they have their central portions 48a and 49a apertured (Figures 4 and 8) to receive therethrough eyelets 50, 51 which, however, pass also through the horizontal portions 52, 53, respectively, of L-shaped male connector or contact members or prongs 54, 55, respectively, preferably made of suitable sheet metal. These horizontal portions 52, 53 are preferably seated against the upper faces of the central portions 48a, 49a of the contact members and fit the opposed side walls of the channels, so as to prevent rotation. When the eyelets 50, 51, after having their lower ends passed through suitable holes in the insulating member 42 (Figure 8), are spun or headed over, the prong connector elements 54 and 55 become electrically connected to the contact members 49 and 48, respectively, and also mechanically interconnected with them as well as mechanically and securely mounted in upstanding position with respect to the insulating member 42. The holes in the latter through which the eyelets 50 and 51 pass are, in the under face of the insulating member 42, appropriately countersunk (Figure 8) so as to space the eyelets appropriately from the bottom 33 of the sheet metal casing 30. Extending from the central hole 45 and in the barrier that is formed between the channels 46, 47 (see Figure 4) there are formed in the insulating member 42 channels 56 and 57 for accommodating the insulated conductors 24, 25 and to lead the bared and preferably stranded conductors 40 and 39 thereof into coacting relationship with the conductor-engaging contact members 49, 48, respectively. As shown in Figure 4, and bearing in mind that the slotted end portions of the contact plates project upwardly and preferably beyond the upper face of the insulating member 42, the bared conductors are interleaved with the contact plates, by way of the slots S. Thus, a portion of the bared conductor 39 underlies the two end portions 48b, 48c and overlies the central portion 48a; in like manner, a portion of the bared conductor 40 underlies parts of the end portions 49c and 49b but overlies the intervening and central portion 49a. This assemblage or interleaving of the conductors is a simple operation, is quickly performed manually, and requires no tools.

Having completed the interengagement of the bared wires with the two contact plates, there is next inserted into the casing 30 an annulus 60 (Figures 6 and 7) of a suitable insulating material but preferably an insulating material that is resilient or elastic, such as vulcanized rubber compound, to have a suitable elastic resiliency and flexibility. The annulus 60 is preferably of an external diameter just about equal to the diameter of the circle within which the arcuate recesses 46, 47 and the correspondingly arcuate contact members 48, 49 fall and it is of a radial dimension just about equal to the radial dimension or width of the channels 46, 47, but it has two cut-outs 60a and 60b (Figure 6) diametrically opposed to accommodate therein the upstanding male or prong parts 54, 55 which, as already appears above (see Figures 2 and 8) are also diametrically opposed.

Accordingly, the annulus 60 is next placed into the casing 30, the opposed cut-outs 60a—60b accommodating the prong parts 54, 55, respectively, as the member 60 is put into the casing 30, bypassing, as it does, the inwardly projecting lugs or ears 32c, 32d of the casing, and it is brought to rest above the interleaved conductors and contact plates, the walls of the cut-outs 60a—60b coacting with the prong parts 54, 55 to hold the annulus 60 against lateral or rotary displacement. Thus far the end portions of the bendable contact plates are still in upwardly bent position.

I then provide a suitable means for compressing the resilient annulus 60 and for holding it sufficiently compressed to clamp the interleaved conductors and bendable contact plates, and also to bend these interleaved parts, between itself and the bottoms of the channels or recesses 46, 47, and preferably this means comprises a rigid disk-like plate 62 preferably made of an insulating material of suitable rigidity, like Bakelite, fiber, or the like. Its outside diameter preferably snugly matches the inside diameter of the casing 30 and it has two rectangular holes 63, 64 appropriately shaped and spaced to receive therethrough the contact prongs 54, 55, respectively, and at appropriate diametrically opposed points in its periphery, preferably in alinement with the cut-outs 43, 44 in the member 42, the insulating part 62 has cut-outs 65, 66, similarly shaped. The prong parts 54, 55 thus also aline the cut-outs 65, 66 in the member 62 with the cut-outs 43, 44, respectively, in the member 42 (see Figure 3), and it will be seen also that these prong parts take part in alining the members 42, 60 and 62. This latter action is desirable where, as may be the preferable procedure, it is desirable or possible to pull enough slack in the conductors 24, 25 to bring them out of the casing 30 sufficiently to permit the conductors to be assembled to the contact plates as above described but entirely externally of the casing 30, whence the members 60 and 62 may be assembled to the part 42 and the resultant thus assembled entity then inserted as a unit into the casing 30.

In either case, the cut-outs 65, 66 in the member 62 by-passes the opposed lugs or ears 32c, 32d in the casing 30, and, the closure member 62 being of appropriate thickness to project upwardly beyond the ears 32c and 32d with the member 60 not compressed, manual pressure is now applied to the member 62 to compress the resilient annulus 60 to bring the face of the member 62 below the opposed lugs 32c, 32d, whence the inserted entity is manually rotated, utilizing the upstanding prong parts 54, 55 as convenient handles for

this purpose, thus to bring the upper peripheral surface of the member **62** underneath the opposed ears **32c, 32d**.

Preferably, the member **62** has in its upper face adjacent its periphery and at diametrically opposed points recesses **62a** and **62b** of a depth about equal to the thickness of the sheet metal of the ears **32c** and **32d** and also shaped to accommodate the latter respectively. Accordingly, upon carrying out the above-described rotary movement of the inserted assembled entity, that movement is continued until these opposed recesses **62a**, **62b** come into juxtaposition respectively to the ears **32d**, **32c**, the latter being entered into them by the reaction of the compressed resilient member **60** which continues under compression to hold the member **62** with the opposed ears seated in its opposed recesses. The latter parts are thus interengaged and prevent accidental or inadvertent rotary movement of the inserted entity, and dependable permanency of assemblage of the unit or part A of the separable connecting device is thus assured.

In Figure 8 the compressed state or condition of the resilient annulus **60** is indicated and it will be seen that its opposed arcuate portions are pressed downwardly into the arcuate channels **46, 47**, thereby being pressed against the interleaved conductor and bendable contact plate assemblies and causing the latter respectively to conform, by bending, if necessary, to the now closed but resiliently constricted channels or recesses. For example, the theretofore upwardly inclined end portions of the contact plates are pressed downwardly into the channels and such portions of the bared conductors as underlie these end portions of the connector plates are clamped between the bottoms of the channels and these end portions themselves, while the resilient annulus itself presses the intervening portions of the conductors downwardly against the metallic parts that are exposed between the slots in these end portions. Thus, a dependable low resistance electrical contact between conductors and their respective contact members or plates is assured and, moreover, the pressure of interengagement is made a continuous one inasmuch as the annulus **60** remains, in the assemblage, under substantial compression. At the same time, the interrelationship of the conductors with their respective contact plates is mechanically a secure anchorage, not only by reason of the above-mentioned clamping pressure but also by reason of the snubbing action that results from that interrelationship and from the virtual flattening out against the bottoms of the recesses of the conductor and contact plate assemblies. Moreover, the mechanical anchorage is one that dependably withstands strain or pull upon the conductors.

The closure member **62**, as will be seen from Figures 2 and 3, furthermore, has the plane of its upper or exposed face substantially flush with the plane or face of the appliance part **20**, thus substantially avoiding unsightly or undesirable disruption of continuity of surface or appearance; upstanding, however, from the closure member **62** and hence from the general plane of the surface of the appliance part **20** are the two male or prong parts **54, 55**, and because of the mechanical relationship thereof to the parts inserted and mounted within the casing **30** as well as because of their preferred structure, the parts **54** and **55** present strong and rigid structures well capable of resisting strains, particularly normal to the plane of the section along which the view of Figure 8 is taken.

Thus, while the lower ends of the prong parts **54, 55** are dependably anchored by the L-shaped portions thereof to the insulating member **42**, intermediate portions of the prong parts **54, 55** pass snugly through the holes **63, 64** in the closure member **62** and thus give these prong parts additional support for resisting such strains and the member **62** thus also aids in relieving the securing means, such as the eyelets **50, 51** from taking all of such stress or strain.

Preferably, where relatively light sheet metal is employed in making up the prong parts **54, 55**, each is doubled over upon itself, as is better shown in Figure 8, to a sufficient extent to bring the free ends **54a** and **55a** thereof well within the holes **63, 64** of the member **62**. Thus, both vertical members of the looped-over portions of the prong parts **54, 55** are seated snugly in the holes **63, 64** and together act to increase the above-mentioned rigidity of the prong parts.

Preferably, also, the extreme ends or heads of the male or prong parts **54, 55** are rounded over and tapered and the above-described looped-over construction of these parts lends itself to inexpensive and dependable shaping or formation to that effect. Thus, in any suitable way, as, for example, in the course of bending the portions **54a** and **55a**, respectively, relative to the remainder of these parts, the metal at the loop or eye thus formed at the extreme ends of the members **54** and **55** is shaped in any suitable way to give that loop or terminus the tapered shape better shown in Figures 2 and 4, thus giving the heads of the prong parts **54, 55** a tapered shape when viewed in plan, as in Figure 2, with the smaller-dimensioned edges **54b** and **55b** facing toward the left. And when assembled to the appliance, as in Figure 1, the parts are so positioned that the smaller or narrower ends **54b** and **55b** of the tapered heads of the male parts **54, 55**, respectively, face away from the direction from which the ultimate pull or strain on the flexible cord conductor **23** (Figure 1) is to come, all for coaction with the companion part B of the separable connector device in the manner later described in detail.

The part B, turning now to Figures 9–15, comprises a shell or casing part **70**, preferably of sheet metal, and having a top wall **71** somewhat oval in shape (Figure 9) from which extends a downwardly directed flange or side wall **72** interrupted, however, at the right-hand end to form a mouth or opening **73**. Similarly shaped as to outline so as to be received into the casing part **70** but of less thickness than the depth of the casing part **70**, is a member **74** (Figures 10 and 14), and made of a suitable insulating material but preferably an insulating material that is resilient or elastic, like the member **60** of Figures 2–8. The upper face of member **74**, as viewed in Figure 10, snugly fits against the inner face of the shell **70** and it may be secured into the latter in any suitable way, illustratively and preferably as by a cement. In its underface, as viewed in Figure 10 and hence in the face as seen in Figure 11, that face being preferably substantially flat, there are formed, as by molding, two arcuate channels **75** and **76**, leaving between them a barrier **77** with a central cylindrical enlargement **78** therein. The right-hand ends of the channels **75, 76** are extended to join a larger channel **79** formed in the member **74** and extending along the right-hand portion thereof and including that portion which extends

into the mouth 73 in the side wall of the casing part 70. Channel 79 approximates in cross-section that of the flexible cord conductor 23 (Figures 1 and 11) which may be brought to rest in the larger channel 79, whence the insulation may be stripped off the ends of the conductors, usually stranded, to bring them, as at 81, 82, into coaction with conductor-engaging contact members 83, 84 seated in the recesses or channels 75, 76, respectively.

The members 83, 84 are preferably of bendable sheet metal, preferably somewhat springy, like phosphor bronze, and have the general characteristics of the members 48 and 49 of Figure 4 above described.

Thus, members 83 and 84 have central or intermediate flat portions $83^a$, $84^a$ with upwardly bent end portions $83^b$, $84^b$ and $83^c$, $84^c$, these end portions being slotted as at S. The members 83, 84 are preferably secured in their respective channels in any suitable way, preferably as by a cement acting between the intermediate flat portions $83^a$, $84^a$ thereof and the bottoms of the channels.

And with the end portions bent upwardly and outwardly of the channels, the bared conductors 81, 82 may be interleaved therewith, as will now be clear, and as is indicated in Figure 11, the cord structure 23 with its insulation intact resting in the entry channel 79.

The insulating member 74 has a central aperture 85 that extends through the central enlargement 78 of the barrier 77—78 and that registers with a countersunk hole 86 in the top wall 71 of the shell 70 (Figure 14), the metal of the latter around the hole 86 being pressed or drawn downwardly, as shown, and member 74 being countersunk about the hole 85 to interfit therewith; thus a screw 87 (Figure 14) may be passed through these parts with its head flush with the exterior face of the shell 70, the screw to coact with a member 88 made of insulating material and in outline shaped to be received into the shell 70. Member 88 is preferably of substantial thickness and while, for certain purposes, it may be made of a rigid insulating material, I preferably make it of a resiliently yieldable material like rubber, having characteristics like those of the members 60 and 74 above described, but preferably, for purposes later made clear, being compounded of a rubber which when vulcanized or cured has somewhat less yieldability and flexibility.

The upper face of the member 88, as viewed in Figures 10 and 14, is shaped and channeled or recessed substantially the same as and substantially to mate with the face of the resilient member 74 as the latter is seen in Figure 11; thus, turning to Figure 12, member 88 has in its face two arcuate channels 89, 90 separated by a barrier 91, 91 that has a central cylindrical enlargement 92 apertured centrally, as at 93 (Figure 14), and the right-hand portion of member 88 (Figure 12) that extends into the mouth 73 of the shell 70 has in its face a relatively shallow channel 94 to which the channels 89 and 90 are extended. If member 88 is thus inserted into the shell 70 so that its face contacts the face of the member 74, the various channels, barriers, and the like, substantially mate with each other and form counterparts of each other.

Member 88 has formed in it two slots generally indicated by the reference characters 95 and 96 (Figures 12, 13 and 14) that extend from the respective bottoms of the channels or recesses 89 and 90 (see Figure 14) through the member 88 to the bottom face of the latter, one to each side of the central barrier enlargement 92 (Figure 12), for the reception of combined contact and female or socket members 97 and 98, respectively, the latter being symmetrical and one of them being shown in perspective in Figure 15.

Thus, referring to Figure 15, which shows the member 98, it is preferably made of sheet metal which can be, if desired, relatively light, and preferably it is made of sheet metal having appropriate springiness, such as phosphor bronze. In preferred form it comprises a central substantially flat portion 99 with end extensions 100, 101 shaped in outline so as to be readily received within the recess or channel 90 of member 88 (Figure 12) and to form in general expanse a counterpart to the contact member 84 to which, with its interleaved conductor, it is to become juxtaposed.

The end portion 100 (Figure 15) is apertured as at 102 so that end portion 100, resting against the bottom of the recess 90 (Figure 10) may be secured to the member 98 as by an eyelet 103 (Figure 10) that passes through the aperture 102 and through a suitable counterbored hole in the member 88, as shown in Figure 10. The opposite end portion 101 also rests against the bottom of the channel 90 (Figures 12 and 10).

At the two longitudinal edges of the intermediate portion 99 (Figure 15) the sheet metal of the part 98 is extended downwardly in two opposed flanges, one of which, 104, extends at right angles to the plane of the portion 99 to provide an inside face with which ultimately the straight or plane left-hand face, as viewed in Figure 8, of the male prong member 55 is to coact, and the other of which, 105, is curved downwardly and inwardly toward the face of the opposed member 104 but with progressively diminishing distance between the inside face of the members 104 and 105 in a direction from the right to the left, as viewed in Figure 15, thus to provide a recess or socket having the same general tapered shape as the end portions of the prong member 55, as earlier above described, and, furthermore, thereby permitting entry of the prong 55 in between the members 104 and 105 only upon movement of the part 55 in a direction from the right to the left in Figure 15.

The slot 96 is shaped snugly to receive therein these depending portions 104, 105 of the member 98, as the latter is assembled to the insulating part 88 and preferably the slot 96 tapered both longitudinally and vertically (see Figures 12 and 14) snugly to receive these opposed socket-forming parts 104—105, the latter terminating a substantial and safe distance from the bottom face of the member 88 as that face is seen in Figures 14 and 13. In that face the mouth of the slot 96 is relatively quite narrow.

To the right of the slot 96, as seen in Figures 13 and 12, the slot has a rectilinear extension $96^a$ extending clear through from the bottom of the channel 90 through the bottom face of the member 88, the end portion 101 of member 98 overlying that slot extension, as seen in Figures 13 and 12.

Contact and socket member 97 is in construction symmetrical to the member 98 just described, and it has a flat intermediate sheet metal portion 106 with end extensions 107 and 108 and tapered socket-forming opposed flanges 109 and 110, all respectively similar to the parts

99, 100, 101, 104 and 105 of the member 98, an eyelet 111 in like manner securing the member 97 in position, with the tapered socket-forming parts 109—110 received in the correspondingly shaped slot 95 to the right of which, as viewed in Figures 12 and 13, it has a slot extension $95^a$ similar to the slot extension $96^a$.

These slot extensions, as seen in Figure 13, are wider than the mouths of the slots 95 and 96 in the under face of the member 88, being of sufficient width and length and depth freely to receive therein the male or prong connector parts 54 and 55.

In the central aperture 93 (Figure 14) is secured, as by molding or flanging over, or the like, an internally threaded sleeve or eyelet member 112 for coaction with the screw 87. Accordingly, after having related the bared conductor ends 81, 82 (Figure 11) to the bendable sheet metal contact plates 83, 84, respectively, the member 88 with its tapered socket and contact parts is next inserted into the shell 70 with the side walls of which it snugly interfits, thus bringing the interthreaded conductor and connector plate 81, 83 in substantially mating superimposition with respect to the contact and socket part 97, and establishing similar relationship between the inner threaded conductor and connector plate 82—84 and the contact and socket member 98.

And to better balance these superimposed parts, the end members 101 and 108 of the connector-socket parts 98 and 97 are preferably dished upwardly, as seen in Figures 10 and 15, to compensate, in point of height, for the material of the eyelets 103 and 111, and as the screw 87 is tightened up, the member 98 is drawn inwardly of the shell 70, subjecting the resilient member 74 to compression, effecting construction of the now closed channels 75—89 and 76—90, and effecting a dependable clamping, between the opposed bottoms of the former, of the member 97, conductor 81 and bendable connector plate 83 interleaved therewith, and between the opposed bottoms of the latter, of the member 98, conductor 82 and bendable connector plate 84 interleaved therewith. Secure and dependable mechanical anchorage of the conductors is achieved and also a long-lasting low resistance electrical connection between the parts and particularly of the extension of the circuit to the socket members 97, 98. At the same time, the flexible cord conductor 23 (Figures 11 and 10) entered intact within and between the companion channels 79 and 94 becomes securely gripped and mechanically anchored. All of these clamping actions, plus the snubbing action achieved by the relationship of the bared conductors with the slotted parts (see Figure 11), are maintained and enhanced by the continued pressure exertion on the part of the compressed resilient member 74. If, as is preferred, the member 88 is made of a resilient material, preferably somewhat less resilient than the member 74, as above noted, the compression of the member 88 resulting from the tightening up of the screw 87, contributes to the just described actions but also takes part in other coactions about to be described.

Thus, a dependable assemblage of the part B of the separable connector device to and with the flexible cord conductor 23 is achieved and, moreover, the part B is free from exposed live parts inasmuch as the live socket-forming members 104—105 and 109—110 are dependably housed well within the narrow-mouthed slots 95 and 96, and accordingly there is no element of risk or danger in the handling of the part B when detached from its companion part A.

When, however, the part B is to be assembled to the part A, it is placed over the part A so as to bring the extensions $95^a$ and $96^a$, respectively, over the male or prong parts 54 and 55, whence member B may be moved toward member A to enter the connector prongs into these slot extensions; thereupon the member B is bodily slid or moved in a direction toward the right, as viewed in Figures 1, 2 and 3, thereby moving the tapered socket parts 95 and 96 toward the upstanding prong connectors 54 and 55, the latter respectively entering the former and coming to rest in the relationship shown in Figures 1, 10 and 14.

Now, in the preferred embodiment, the socket parts are tapered or approximately frusto-conical in the same direction as the heads of the prong parts so that the latter become wedged into the former. In this connection, a dependable electrical interconnection is achieved and several preferred coactions take place. Preferably, the wedging action also has a component in a direction to draw the prong parts upwardly (Figures 8 and 14) in which case the resilient part 60 (Figure 8) may yield, permitting part 42 to move with the prongs; thus part 60 coacts to hold parts A and B together. Where the prong connectors 54 and 55 are made as shown in Figure 8 and as above described, namely, by looping sheet metal over upon itself, the tapered ends or heads have an appropriate yieldability or resiliency due to the corresponding characteristic of the sheet metal employed. Thus, a dependable seating within the socket members and a resilient or consistently exerted pressure of contact is brought about. A similar or analogous resiliency or continued pressure of contact is preferably also brought about by the opposed depending socket-forming parts 104, 105 of the member 98 and 109—110 of the member 97. And preferably security of mechanical gripping and tightness of electrical contact are assured by the coaction of, for example, the compressed resilient member 74 (see Figure 14) which, through the pressure it exerts in a downward direction upon the members 97 and 98 tends to wedge the downwardly tapered socket-forming parts into the upwardly tapered slots 95, 96, respectively, thus insuring tightness of gripping by the opposed socket-forming parts and thus also opposing any tendency of the latter to yield unduly to overstraining of the heads of the prong parts 54 and 55 into the socket-forming parts.

Where, as is preferred, the member 88 has also resiliency characteristics, its compression exerts a continuous pressure against the outer faces of the opposed socket-forming parts, thus dependably and yieldingly supporting the latter and contributing its tendency to expand to causing the opposed socket-forming parts tightly to hold the prong parts. The member 88 being initially snugly fitted into the shell 70 and being received thereinto in substantial depth or thickness, compression of the central barrier enlargement 92 and the parts in close proximity thereto effects a tendency of the resilient material to expand outwardly or radially and hence against the rigid peripheral or side wall 72 of the casing 70, and thus the resiliency of the member 88 in a radial direction may also be made to take material part in supporting and acting upon the socket-forming parts. With such coacting features,

also, it may be noted, the socket-forming parts are so well supported and backed up resiliently that, furthermore, they may be made of relatively light sheet metal.

Thus, the parts B and A are dependably held in mechanical and electrical interconnection and loosening up of the mechanical and electrical connecting parts is dependably precluded. Sparking or high resistance contacts cannot take place and, furthermore, the relationship of the various parts is such that accidental or intentional pulls on the flexible cord conductor **23** tend to pull the part B of the device along the face of the part A but in a direction simply to tighten the interfitting of the tapered heads of the prong parts **54** and **55** in their corresponding and respectively tapered socket-forming parts. Substantial strains of this character are easily withstood for, furthermore, the member **62** (Figures 8 and 2) as earlier above noted, supports the prong parts **54** and **55** at points materially spaced from their lower or anchored ends and thus the extreme rigidity presented by the looped-over projecting parts, as seen in Figure 8, against bending away from the plane of the cross-section of Figure 8 is permitted full play, and, moreover, without subjecting the anchorage at the ends of the members to ruinous stress. The prong parts **54** and **55** are thus in effect cantilevered.

Also, the part B cannot be pulled away from the part A in a direction normal to the face of the part A. Strains that act in that direction or have components so acting, simply result in effecting a tighter wedging of the prong parts in the socket parts, as appears from Figure 4, and thus assembly is maintained. Torsional strains, that is, a twisting of the member B about the axis of the cylindrical casing **30** of the part A are likewise held harmless, for in such case the member **62** (Figures 8 and 2) takes up the reactions due to the force couple that such a twisting tendency on the part of part B exerts through the prong parts **54** and **55**.

However, to disconnect the part B from the part A, part B is forced to the left relative to the part A, as viewed in Figures 1 and 2, thus causing the socket members of part B to slide away from the prong parts, thus effecting disengagement, that movement being continued until the right-hand ends of the slot extensions **95a**, **96a** contact the right-hand vertical edges of the upstanding prong parts **54**, **55**, the latter becoming thus positioned in these slot extensions, whence a movement of the part B in a direction at right angles away from the part A completes the disengagement of the two.

Thus, it will be seen that there has been provided in this invention a device in which the various objects hereinbefore set forth together with many thoroughly practical advantages are successfully achieved. The device is compact, may be constructed in diminutive form, is inexpensive, and is of thoroughly dependable and reliable action, overcoming many disadvantages and deficiencies of present and prior practices. This application is a continuation in part of my co-pending applications Serial Nos. 140,099 and 140,100, filed May 1, 1937, and now respectively Letters Patent Nos. 2,112,753 and 2,112,752, issued March 29, 1938; subject matter common to these two applications and my present application is claimed in the said co-pending applications.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth, or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A separable plug and socket connector for electrically connecting an electrical device to a power circuit and comprising a plug unit and a socket unit presenting faces adapted to be brought into substantial contact with each other, said plug unit having projecting from its said face a contact prong that has a tapered head substantially frusto-conical with its axis parallel to said face and having means for securing it to said electrical device to expose said contact prong from the latter, said socket unit having a recess therein exposed through its said face in a mouth that is large enough at one end to permit the head of said prong to pass therethrough upon bringing said two units into face to face engagement, the remaining portion of said mouth being restricted to prevent passage therethrough of the said head of said prong while permitting movement lengthwise thereof of another portion of the prong as upon subsequent sliding movement in substantial face to face engagement of said two units in a direction from the larger mouthed end of said recess to the narrower mouthed end thereof, said socket unit having secured thereto an electrical conductor extending laterally from a side of said unit that is adjacent the larger mouthed end of said recess, whereby a pull on the conductor tends to slide said socket unit relative to said plug unit in the aforesaid direction, and a socket contact means in said recess in electrical connection with said conductor and presenting at least two opposed tapered parts in that portion of the recess underlying said narrower mouthed end for the reception therebetween of said tapered head of said prong for mechanical and electrical engagement therebetween, whereby a pull on said conductor as aforesaid is effective to increase the wedging of said tapered head between said opposed tapered parts.

2. A separable plug and socket connector comprising a plug unit and a socket unit presenting faces adapted to be brought into juxtaposition with each other, said plug unit having a contact prong projecting from its said face and said contact prong having a tapered head substantially frusto-conical with its axis substantially parallel to said face, said socket unit having a recess therein exposed through its said face in a mouth that is large enough at one end to permit the head of said prong to pass therethrough and that is sufficiently extended to the other end thereof to permit movement lengthwise thereof of another portion of the prong upon subsequent relative sliding movement of said two units in a direction from said first-mentioned end of said mouth toward said second-mentioned end thereof, and a socket contact means in said recess presenting at least two opposed tapered parts, at least one of which is movable relative to the other, in that portion of the recess underlying said second-mentioned end of said mouth, for the reception therebetween of said tapered head of said prong, said socket unit including a member made of resilient material acting upon at least one of said parts of said socket member and means maintaining said resilient member under compression sufficient to yieldingly resist separation of

said two socket parts and thereby acting to cause said two parts yieldingly to grip the tapered head of said prong.

3. A separable plug and socket connector comprising a plug unit and a socket unit presenting faces adapted to be brought into juxtaposition with each other, said plug unit having a contact prong projecting from its said face and said contact prong having a tapered head substantially frusto-conical with its axis substantially parallel to said face, said socket unit having a recess therein exposed through its said face in a mouth that is large enough at one end to permit the head of said prong to pass therethrough and that is sufficiently extended to the other end thereof to permit movement lengthwise thereof of another portion of the prong upon subsequent relative sliding movement of said two units in a direction from said first-mentioned end of said mouth toward said second-mentioned end thereof, and a socket contact means in said recess presenting at least two opposed tapered parts, at least one of which is movable relative to the other, in that portion of the recess underlying said second-mentioned end of said mouth, for the reception therebetween of said tapered head of said prong, said socket unit comprising a member of resilient insulating material, whereby the walls of said elongated recess are yieldable, and means holding said resilient material under compression with a force sufficient to tend to restrict said recess and thereby act upon said opposed socket parts yieldingly to urge one toward the other and effect gripping of the tapered head of said prong.

4. A separable plug and socket connector comprising a plug unit and a socket unit presenting faces adapted to be brought into juxtaposition with each other, said plug unit having a connector element in the form of a contact prong projecting from its said face and said contact prong having a tapered head substantially frusto-conical with its axis substantially parallel to said face, said socket unit having a recess therein exposed through its said face in a mouth that is large enough at one end to permit the head of said prong to pass therethrough and that is sufficiently extended to the other end thereof to permit movement lengthwise thereof of another portion of the prong upon subsequent relative sliding movement of said two units in a direction from said first-mentioned end of said mouth toward said second-mentioned end thereof, and the connector element of said socket unit being in the form of a socket contact means in said recess presenting at least two opposed tapered parts in that portion of the recess underlying said second-mentioned end of said mouth, for the reception therebetween of said tapered head of said prong, one of said units having channel means extending in the direction of the axis of taper for bringing a conductor like a flexible cord conductor into the unit but from a side thereof, said one unit having means for making electrical connection of the conductor with the connector element of the unit, said channel means entering the unit at such a point that a pull on the conductor tends to effect relative sliding movement between said two units in the aforesaid direction and thereby to move its unit relative to the other in a direction to increase the wedging action of the prong head in the socket parts.

5. A separable plug and socket connector comprising a plug unit and a socket unit presenting faces adapted to be brought into juxtaposition with each other, said plug unit having a contact prong projecting from its said face and said contact prong having a tapered head substantially frusto-conical with its axis substantially parallel to said face, said socket unit having a recess therein exposed through its said face in a mouth that is large enough at one end to permit the head of said prong to pass therethrough and that is sufficiently extended to the other end thereof to permit movement lengthwise thereof of another portion of the prong upon subsequent relative sliding movement of said two units in a direction from said first-mentioned end of said mouth toward said second-mentioned end thereof, and a socket contact means in said recess presenting at least two opposed tapered parts in that portion of the recess underlying said second-mentioned end of said mouth, for the reception therebetween of said tapered head of said prong, the prong of the plug unit comprising an elongated sheet metal member bent over upon itself to give the prong a double thickness of sheet metal, said tapered head being formed by correspondingly varying the radius of curvature of bending of the sheet metal to form the aforesaid substantially frusto-conical head, whereby to give said head a yieldability for coaction with said opposed parts of said tapered socket.

6. A separable plug and socket connector comprising a plug unit and a socket unit presenting faces adapted to be brought into juxtaposition with each other, said plug unit having a contact prong projecting from its said face and said contact prong having a tapered head substantially frusto-conical with its axis substantially parallel to said face, said socket unit having a recess therein exposed through its said face in a mouth that is large enough at one end to permit the head of said prong to pass therethrough and that is sufficiently extended to the other end thereof to permit movement lengthwise thereof of another portion of the prong upon subsequent relative sliding movement of said two units in a direction from said first-mentioned end of said mouth toward said second-mentioned end thereof, and a socket contact means in said recess presenting at least two opposed tapered parts in that portion of the recess underlying said second-mentioned end of said mouth, for the reception therebetween of said tapered head of said prong, the prong of the plug unit comprising an elongated sheet metal member bent over upon itself to give the prong a double thickness of sheet metal, said tapered head being formed by correspondingly varying the radius of curvature of bending of the sheet metal to form the aforesaid substantially frusto-conical head, whereby to give said head a yieldability for coaction with said opposed parts of said tapered socket, said plug unit comprising two rigid members spaced from each other, there being means anchoring that end of said prong remote from said head to one of said rigid members and the other rigid member having an aperture through which an intermediate part of said prong extends for supporting said intermediate part, and means preventing relative lateral displacement between said two rigid members thereby to cause said two members to give said prong cantilever supports and said prong to resist bending or distortion under the strain of relative movement between said two units in a direction lengthwise of said recess.

7. A separable plug and socket connector com-

prising a plug unit and a socket unit presenting faces adapted to be brought into juxtaposition with each other, said plug unit having a contact prong projecting from its said face and said contact prong having a tapered head substantially frusto-conical with its axis substantially parallel to said face, said socket unit having a recess therein exposed through its said face in a mouth that is large enough at one end to permit the head of said prong to pass therethrough and that is sufficiently extended to the other end thereof to permit movement lengthwise thereof of another portion of the prong upon subsequent relative sliding movement of said two units in a direction from said first-mentioned end of said mouth toward said second-mentioned end thereof, and a socket contact means in said recess presenting at least two opposed tapered parts in that portion of the recess underlying said second-mentioned end of said mouth, for the reception therebetween of said tapered head of said prong, the prong of the plug unit comprising an elongated sheet metal member bent over upon itself to give the prong a double thickness of sheet metal, said tapered head being formed by correspondingly varying the radius of curvature of bending of the sheet metal to form the aforesaid substantially frusto-conical head, whereby to give said head a yieldability for coaction with said opposed parts of said tapered socket, said plug unit comprising a shell having seated therein and held against relative lateral displacement by the walls thereof two rigid members spaced in the direction of the length of said prong, one of said members having that end of said prong remote from said head anchored thereto and the other of said members having an aperture through which extends an intermediate portion of said prong for supporting said intermediate part, whereby the latter is by said two members given a cantilever support, a conductor element extending into the space between said two spaced members and in contact with a portion of said prong, and a member of resilient material under compression between said two rigid members for pressing said conductor element into electrical contact with said prong part and for preventing diminution of the spacing between said two rigid members and thereby to maintain said spaced cantilever supports for said prong.

8. An electrical connection means comprising, in combination, a shell having a disk-like bottom and cylindrical side wall with two opposed ears overhanging the open end thereof, a disk-like member of insulating material having upstanding therefrom and mechanically secured thereto prong-like contact means, said disk-like member being snugly receivable within the cylindrical wall of said shell and having opposed peripheral cut-away portions to by-pass said opposed ears and presenting conductive means on that face thereof toward the open end of said shell, said conductive means being in electrical connection with said prong-like contact means for the reception thereagainst of a conductor, a conductor resting against said conductive means, an apertured member of resilient insulating material received within said shell and resting against said disk member and against said conductor and said prong-like contact means passing through the aperture in said resilient member, and a disk-like member of rigid insulating material snugly receivable through the open end of said shell and having opposed cut-away portions to by-pass said ears and aperture means through which said prong-like contact means extend, whereby said last-mentioned disk-like member is brought to rest against said resilient member, the outer plane of said last-mentioned disk-like member being spaced outwardly from the plane of said opposed ears sufficiently to require a compression of said resilient member to a sufficient extent to press said conductor against said conductive element before the plane of said second disk member falls within the plane of said ears, whereby upon a subsequent rotation of said second disk member said opposed ears overlie the said outer face thereof and hold said second disk member against movement outwardly of said shell and maintain said resilient member under compression.

9. A construction as claimed in claim 8 in which the aperture means in said second-mentioned disk member and said prong-like contact means relatively snugly interfit whereby said two disk-like members with the parts interposed therebetween are rotated as a unit.

10. An electrical connection means comprising a shell having therein two spaced substantially rigid members, one of them adjacent the otherwise open end of said shell and having an aperture therein and the other being adjacent the other end of the shell and having interengaged therewith a contact prong which is of sufficient length to extend through said aperture in said one member and dimensioned to extend through said aperture, a member of resilient material interposed between said two rigid members to hold them in spaced relation, said two members with said contact prong and interposed resilient member forming an assembly which as a unit is entered into said shell through the said open end thereof, said one rigid member adjacent the open end of said shell and said shell having coacting means interengageable in response to relative movement therebetween for holding said assembly within said shell and with said resilient member under compression, there being interposed between said compressed resilient member and a face of one of said two members two conductive parts that are held in electrical contact by the force of compression of said resilient means, one of said conductive parts being in electrical connection with said contact prong.

11. A separable plug and socket connector comprising a plug unit and a socket unit presenting faces adapted to be brought into substantial contact with each other, said socket unit having a recess in its said face and a socket contact means therein and accessible through said recess, said socket contact means being interiorly wedge-shaped in a direction to draw a member received therein inwardly of said recess, and said plug unit comprising a shell having a side wall and a bottom wall with two relatively rigid members received in said shell, one of said rigid members closing the open end of said shell and the other resting adjacent the bottom of said shell, said other member having mounted thereon a contact prong and the other of said rigid members having an aperture through which said prong passes, and said prong having head-like means for entry into said socket means, and resilient means interposed between said two rigid members and capable of yielding to permit said prong-mounting member to move relative to said shell as said wedge-shaped socket means draws said prong inwardly of said recess.

12. A separable plug and socket connector com-

prising a plug unit having a contact prong and a socket unit having socket contact means respectively related so that said contact prong enters said socket means upon said two units being brought into substantially face to face contact with each other, said socket means and said contact prong having respective shapes to effect, upon the one being pressed into the other, a drawing of said contact prong in a direction toward said socket unit, said contact prong being in electrical connection with a conductive part having a conductor engaged therewith, means yieldingly mounting said contact prong and conductive part in said plug unit to permit said prong and conductive part to move relative to the plug unit under the tendency of the drawing action resulting from interengagement of said prong with said socket means, and means limiting movement of said prong and conductive part relative to said plug unit and acting in response to said relative movement to press said conductive part and engaged conductor together.

13. A separable plug and socket connector comprising a socket member having a slot in a face thereof, said slot having a mouth in said face that is larger at one end than it is at the other, and socket contact means in said socket member operatively related to said slot, said socket contact means having an entry exposed toward said larger mouthed end of said slot, and a plug member having a prong projecting from a face thereof, said prong having a head portion and being enterable through the larger mouthed end of said slot in said socket member in response to bringing said plug member and socket member into face-to-face relation and said head portion, in response to relative sliding movement between said plug member and socket member in a direction lengthwise of said slot, being entered into and moved along said socket contact means, one of said members having channel means extending from a side thereof and in the direction of said slot for bringing an electrical conductor with an insulating jacket about the latter, like an inulated flexible cord conductor, into the member from said side and having means for gripping the insulating jacket with the conductor therein and for anchoring the jacket to said one member so that a pull on the jacket with the conductor therein is by said gripping and anchoring means transmitted to said one member and tends to effect continued relative sliding movement between said two members in the aforesaid direction and thereby have the effect of moving said prong lengthwise of said slot and of moving said head portion further into said socket contact means.

14. An electrical connection means comprising a shell having therein two members of insulating material, one of said members having a face exposed outwardly of said shell and having a recess in said face, socket contact means of yieldable sheet metal seated in said recess for the reception of a contact prong inserted into the recess, said socket means having also a portion exposed toward the other of said members and having interposed between it and the latter a conductive part for making electrical connection to said socket means, means holding said two members and said shell assembled with said conductive part clamped between said second-mentioned member and said portion of said socket means, and means responsive to the action of said holding means for exerting a resilient pressure against the yieldable sheet metal of said socket contact means whereby to cause the latter to grip a contact prong received in said socket contact means.

15. An electrical connection means comprising two members of insulating material, one of said members having a face exposed outwardly and having a recess in said face, socket contact means of yieldable sheet metal seated in said recess for the reception of a contact prong inserted thereinto through said recess in said face, said socket means having also a portion exposed toward the other of said members and having interposed between it and the latter a conductive part for making electrical connection to said socket means, means holding said two members together with said conductive part clamped between said second-mentioned member and said portion of said socket means, at least one of said members being of resilient material, said holding means holding the resilient material under sufficient compression to achieve a yielding clamping action upon said conductive member and a yielding pressure upon said yieldable sheet metal of said socket contact means to cause the latter yieldingly to grip a contact prong received therein through said recess.

16. An electrical connection means comprising, in combination, a shell having side walls and at one end a bottom wall, a member seated against said bottom wall and having exposed toward the open end of said shell conductive means, a conductor resting against said conductive means, a member inserted into said shell and substantially closing the open end thereof, a member of resilient insulating material received within said shell and arranged serially with said conductor and conductive means between said first and second members, whereby pressing of said second member inwardly of said shell places said resilient member under compression to clamp said conductor and conductive means together, and means coacting between said second member and said shell and responsive to pressing said second member inwardly of said shell and to movement of said second member in its own plane for holding said second member in inwardly pressed position and for thereby holding said resilient member under compression.

17. An electrical connection means comprising, in combination, means forming a chamber open at one end and having opposed projecting parts adjacent its open end, said chamber having received therein one element of a two-part disconnectable contact means, said element presenting a conductive means and having a conductor in engagement with the latter, and means for holding said element in said chamber and for clamping said conductor and said conductive means together, comprising a part of resilient insulating material and a member substantially closing the open end of said chamber, said member having opposed means which, upon pressing said member inwardly of said chamber to compress said resilient insulating part and upon movement of said member in substantially its own plane, interengage with said opposed parts at the open end of said chamber.

18. A separable plug and socket connector comprising a plug unit having a contact prong and a socket unit having socket contact means respectively related so that said contact prong enters said socket means upon said two units being brought into substantially face to face contact with each other, said socket means and said contact prong having respective shapes to effect, upon the one being pressed into the other, a

drawing of said contact prong in a direction toward said socket unit, means mounting said contact prong in said plug unit for limited movement of said contact prong in the direction of its length, thereby to permit said prong to move relative to the plug unit under the tendency of the drawing action resulting from interengagement of said prong with said socket means, said limiting means comprising a relatively rigid apertured part of said plug unit with the prong passing through the aperture therein and a member of resilient insulating material resting against said rigid part of said plug unit and acting yieldingly to resist the aforesaid movement of said prong.

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